JCB
THE JOURNAL OF CELL BIOLOGY
VOL. 185, NO. 1, APRIL 6, 2009

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Osmoregulation in the zebrafish embryo depends on the correct functioning of ionocyte cells (stained intensely with dyes for mitochondria [red] and sodium [green]). These cells use microRNAs of the *miR-8* family to regulate their osmotic stress pathway.
See page 115.

67 Canonical Wnts function as potent regulators of osteogenesis by human mesenchymal stem cells
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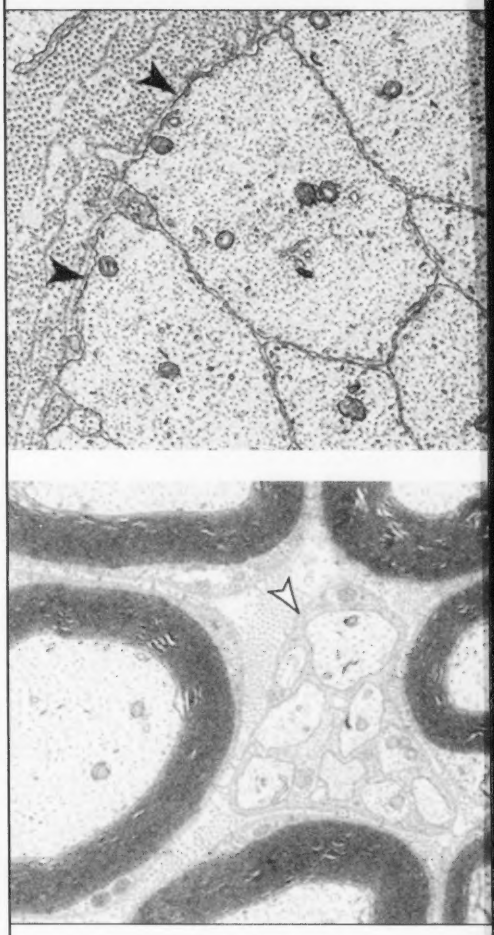
Linda Schneider, Christian-Martin Stock, Peter Dieterich, Bo Hammer Jensen, Lotte Bang Pedersen, Peter Satir, Albrecht Schwab, Søren Tvorup Christensen, and Stine Falsig Pedersen



In mice lacking integrin-linked kinase (top), peripheral nerve axons remain bundled and fail to be myelinated (dark staining in bottom image).
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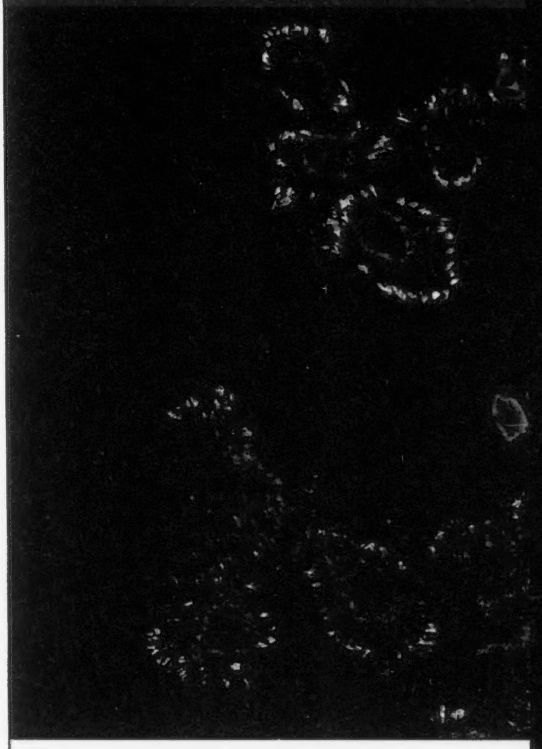

On the cover

Chan et al. find a surprising new function for the tyrosine kinase FAK in inhibiting the formation of invadopodia, the membrane protrusions used by cells to degrade their surrounding extracellular matrix. In FAK's absence, its downstream kinase Src redistributes to invadopodia and away from focal adhesions (where warmer colors indicate lower Src activity).
See page 357.

251 The selfish yeast plasmid uses the nuclear motor Kip1p but not Cin8p for its localization and equal segregation
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265 A conserved CCCH-type zinc finger protein regulates mRNA nuclear adenylation and export
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279 Bax activation by the BH3-only protein Puma promotes cell dependence on antiapoptotic Bcl-2 family members
Tristan Gallenne, Fabien Gautier, Lisa Oliver, Eric Hervouet, Belinda Noël, John A. Hickman, Olivier Geneste, Pierre-François Cartron, François M. Vallette, Stephen Manon, and Philippe Juin

291 Caspase-2 activation in the absence of PIDDosome formation
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341 Dynein light chain regulates axonal trafficking and synaptic levels of Bassoon
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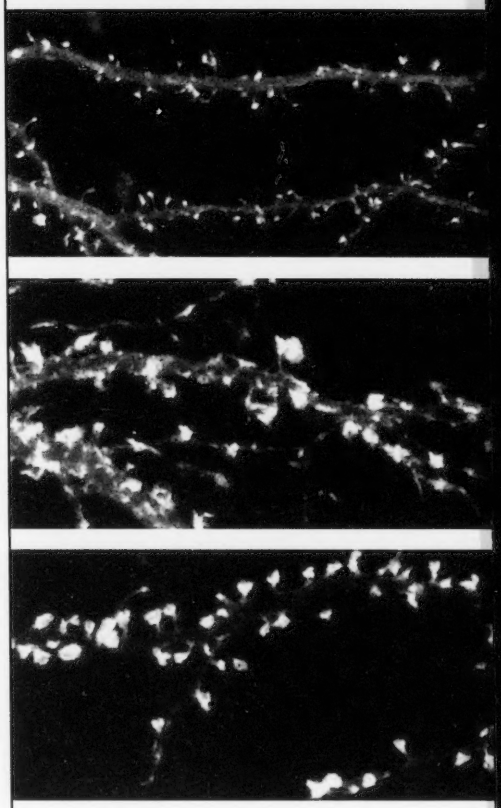
357 FAK alters invadopodia and focal adhesion composition and dynamics to regulate breast cancer invasion
Keefe T. Chan, Christa L. Cortesio, and Anna Huttenlocher



Hotulainen et al. investigate actin polymerization within dendritic spines, the small protrusions that form synapses with excitatory neurons. Expressing an inactive form of the small GTPase Rif (bottom), or depleting its effector, the formin mDia2 (middle), produces spines with shorter necks and larger heads.
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459 The nucleoporins Nup170p and Nup157p are essential for nuclear pore complex assembly
Tadashi Makio, Leslie H. Stanton, Cheng-Chao Lin, David S. Goldfarb, Karsten Weis, and Richard W. Wozniak

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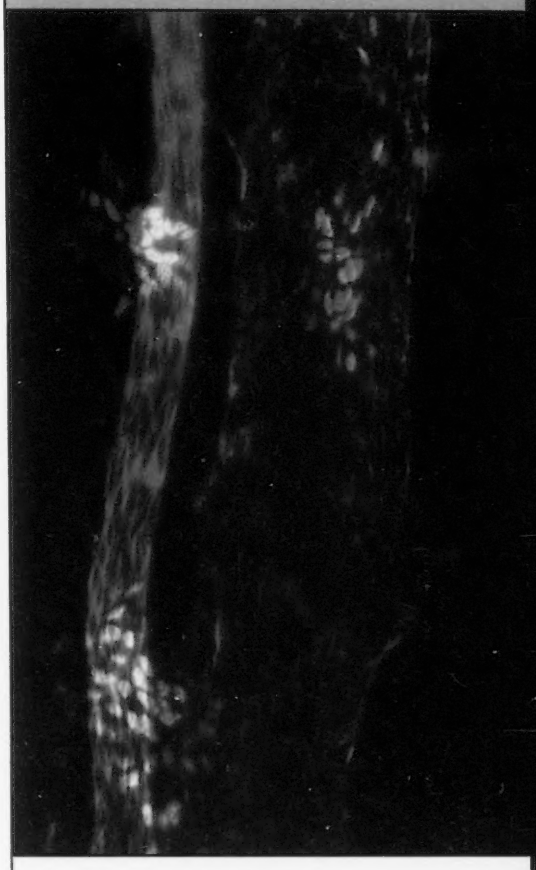

On the cover

Blood vessels (red) irrigate the body's tissues, and lymph vessels (green) drain them. Norrmén et al. identify two transcription factors, Foxc2 and NFATc1, which help build the drainage system.
See page 439.

475 Role of the Ndc1 interaction network in yeast nuclear pore complex assembly and maintenance
Evgeny Onischenko, Leslie H. Stanton, Alexis S. Madrid, Thomas Kieselbach, and Karsten Weis

493 K63-linked ubiquitin chains as a specific signal for protein sorting into the multivesicular body pathway
Elsa Lauwers, Christophe Jacob, and Bruno André

503 Arg interacts with cortactin to promote adhesion-dependent cell edge protrusion
Stefanie Lapetina, Christopher C. Mader, Kazuya Machida, Bruce J. Mayer, and Anthony J. Koleske

521 The coreceptor CD2 uses plasma membrane microdomains to transduce signals in T cells
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535 Capture and release of partially zipped trans-SNARE complexes on intact organelles
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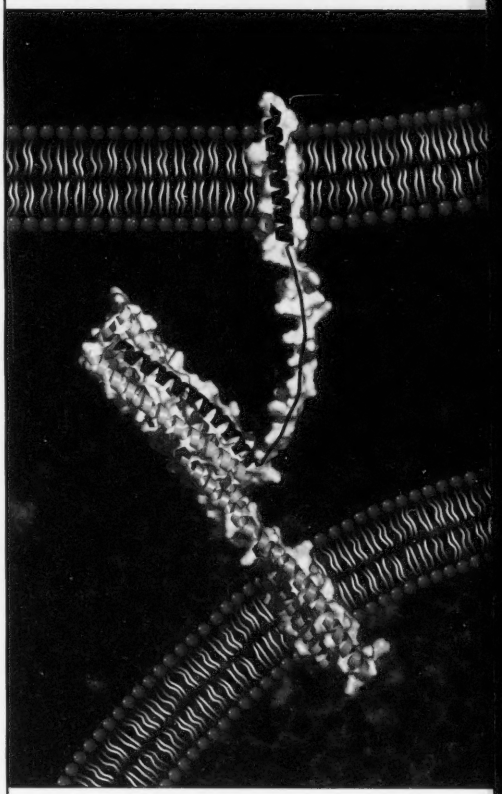
551 Synaptic activity prompts γ-secretase–mediated cleavage of EphA4 and dendritic spine formation
Eiji Inoue, Maki Deguchi-Tawarada, Aki Togawa, Chiyuki Matsui, Kohei Arita, Sayaka Katahira-Tayama, Toshitaka Sato, Emiko Yamauchi, Yoshiya Oda, and Yoshimi Takai



SNARE proteins in separate membranes join together and zip-up to prompt membrane fusion. Schwartz and Merz examine a number of truncated SNARES (pictured) to capture the steps of the zipping process.
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• BDNF sends mixed signals
• Decorin has Met a new receptor
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587 RAD51C facilitates checkpoint signaling by promoting CHK2 phosphorylation
Sophie Badie, Chunyan Liao, Maria Thanasoula, Paul Barber, Mark A. Hill, and Madalena Tarsounas

601 Segregation of sphingolipids and sterols during formation of secretory vesicles at the trans-Golgi network
Robin W. Klemm, Christer S. Ejsing, Michal A. Surma, Hermann-Josef Kaiser, Mathias J. Gerl, Julio L. Sampaio, Quentin de Robillard, Charles Ferguson, Tomasz J. Proszynski, Andrej Shevchenko, and Kai Simons

613 The Yb protein defines a novel organelle and regulates male germline stem cell self-renewal in *Drosophila melanogaster*
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629 Cyclodepsipeptide toxin promotes the degradation of Hsp90 client proteins through chaperone-mediated autophagy
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641 TIP47 functions in the biogenesis of lipid droplets
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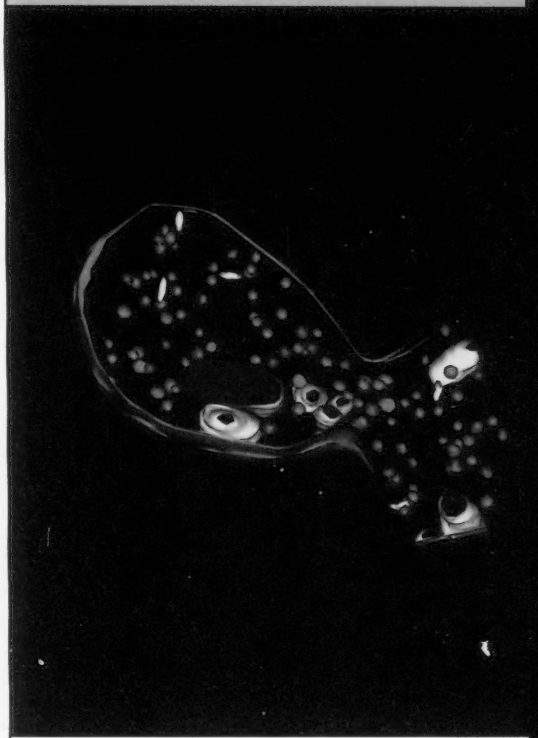


On the cover

A 3D reconstruction of the different membrane compartments of a budding yeast cell. Klemm et al. devise new methods to purify secretory vesicles (red) and Golgi/endosomes (yellow), and analyze their lipid composition, suggesting a mechanism for both protein and lipid sorting at the trans-Golgi network. **See page 601.**

657 VE-PTP controls blood vessel development by balancing Tie-2 activity
Mark Winderlich, Linda Keller, Giuseppe Cagna, Andre Broermann, Olena Kamenyeva, Friedemann Kiefer, Urban Deutsch, Astrid F. Nottebaum, and Dietmar Vestweber

673 The recycling and transcytotic pathways for IgG transport by FcRn are distinct and display an inherent polarity
Salit Tzaban, Ramiro H. Massol, Elizabeth Yen, Wendy Hamman, Scott R. Frank, Lynne A. Lapierre, Steen H. Hansen, James R. Goldenring, Richard S. Blumberg, and Wayne I. Lencer

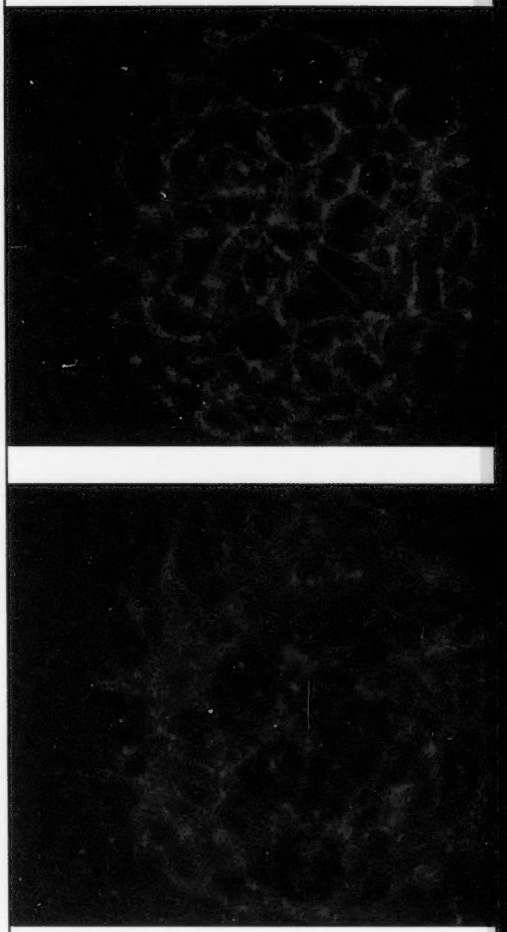
685 Regulation of glutamate receptor subunit availability by microRNAs
Julie Karr, Vasia Vagin, Kaiyun Chen, Subhashree Ganesan, Oxana Olenkina, Vladimir Gvozdev, and David E. Featherstone

699 Integrin-mediated axoglial interactions initiate myelination in the central nervous system
Joana Câmara, Zhen Wang, Cristina Nunes-Fonseca, Hana C. Friedman, Matthew Grove, Diane L. Sherman, Noboru H. Komiyama, Seth G. Grant, Peter J. Brophy, Alan Peterson, and Charles ffrench-Constant

713 Nemo kinase interacts with Mad to coordinate synaptic growth at the *Drosophila* neuromuscular junction
Carlos Merino, Jay Penney, Miranda González, Kazuya Tsurudome, Myriam Moujahidine, Michael B. O'Connor, Esther M. Verheyen, and Pejmun Haghighi

727 Pro-BDNF–induced synaptic depression and retraction at developing neuromuscular synapses
Feng Yang, Hyun-Soo Je, Yuanyuan Ji, Guhan Nagappan, Barbara Hempstead, and Bai Lu

743 Decorin is a novel antagonistic ligand of the Met receptor
Silvia Goldoni, Ashley Humphries, Alexander Nyström, Sampurna Sattar, Rick T. Owens, David J. McQuillan, Keith Ireton, and Renato V. Iozzo



Antibodies against the receptor tyrosine phosphatase VE-PTP cause the enlargement of vascular structures in mouse extra-embryonic allantois membranes (bottom). Winderlich et al. find that VE-PTP keeps endothelial cell proliferation in check by balancing the activity of another receptor called Tie-2.
See page 657.

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756 • Pygo2 opens chromatin and cycles cells
• Heart saves muscle
• Dynamics of staying put
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758 • Hyung Don Ryoo: A healthy career in cellular death
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761 Epigenetics, Wnt signaling, and stem cells: the Pygo2 connection
Valerie Horsley

765 The structural and functional coupling of two molecular machines, the ribosome and the translocon
Arthur E. Johnson

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769 Intermediate filaments exchange subunits along their length and elongate by end-to-end annealing
Gülsen Çolakoğlu and Anthony Brown

779 Classical cadherins control nucleus and centrosome position and cell polarity
Isabelle Dupin, Emeline Camand, and Sandrine Etienne-Manneville

787 Independent cadherin–catenin and Bazooka clusters interact to assemble adherens junctions
Melanie A. McGill, R.F. Andrew McKinley, and Tony J.C. Harris

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797 Induction of alternative lengthening of telomeres-associated PML bodies by p53/p21 requires HP1 proteins
Wei-Qin Jiang, Ze-Huai Zhong, Akira Nguyen, Jeremy D. Henson, Christian D. Toouli, Antony W. Braithwaite, and Roger R. Reddel

811 Pygo2 expands mammary progenitor cells by facilitating histone H3 K4 methylation
Bingnan Gu, Peng Sun, Yuanyang Yuan, Ricardo C. Moraes, Aihua Li, Andy Teng, Anshu Agrawal, Catherine Rhéaume, Virginia Bilanchone, Jacqueline M. Veltmaat, Ken-Ichi Takemaru, Sarah Millar, Eva Y.-H.P. Lee, Michael T. Lewis, Boan Li, and Xing Dai

827 GNL3L stabilizes the TRF1 complex and promotes mitotic transition
Qubo Zhu, Lingjun Meng, Joseph K. Hsu, Tao Lin, Jun Teishima, and Robert Y.L. Tsai

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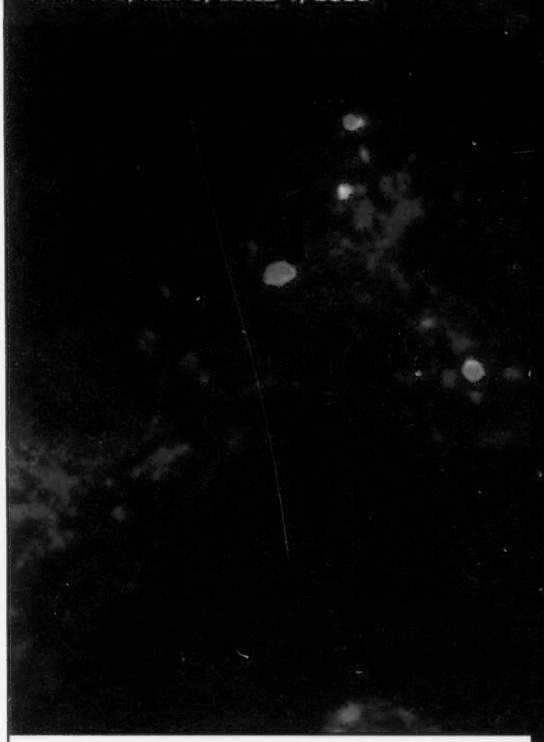


On the cover

Phagosomes deliver their contents to lysosomes where they are digested. *Chlamydia*-filled phagosomes (red dots) escape this fate by rerouting to alternative cellular destinations. Yeung et al. studied the membrane lipid composition of phagosomes directed to different fates.
See page 917.

841 Bub1 regulates chromosome segregation in a kinetochore-independent manner
Christiane Klebig, Dirk Korinth, and Patrick Meraldi

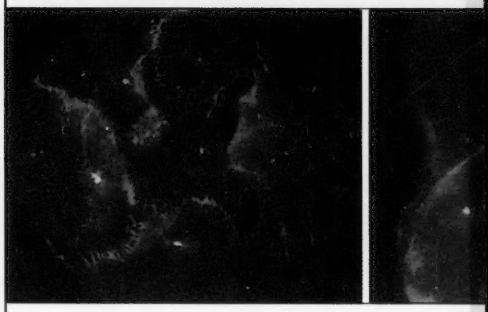
859 Mitotic control of kinetochore-associated dynein and spindle orientation by human Spindly
Ying Wai Chan, Luca L. Fava, Andreas Uldschmid, Michael H.A. Schmitz, Daniel W. Gerlich, Erich A. Nigg, and Anna Santamaria

875 The *S. pombe* mitotic regulator Cut12 promotes spindle pole body activation and integration into the nuclear envelope
Victor A. Tallada, Kenji Tanaka, Mitsuhiro Yanagida, and Iain M. Hagan

889 A trans-membrane segment inside the ribosome exit tunnel triggers RAMP4 recruitment to the Sec61p translocase
Martin R. Pool

903 Rescue of skeletal muscle α-actin–null mice by cardiac (fetal) α-actin
Kristen J. Nowak, Gianina Ravenscroft, Connie Jackaman, Aleksandra Filipovska, Stefan M. Davies, Esther M. Lim, Sarah E. Squire, Allyson C. Potter, Elizabeth Baker, Sophie Clément, Caroline A. Sewry, Victoria Fabian, Kelly Crawford, James L. Lessard, Lisa M. Griffiths, John M. Papadimitriou, Yun Shen, Grant Morahan, Anthony J. Bakker, Kay E. Davies, and Nigel G. Laing

917 Contribution of phosphatidylserine to membrane surface charge and protein targeting during phagosome maturation
Tony Yeung, Bryan Heit, Jean-Francois Dubuisson, Gregory D. Fairn, Basil Chiu, Robert Inman, Andras Kapus, Michele Swanson, and Sergio Grinstein



Cell polarity is directed by cell–cell contacts, show Dupin et al. In wild-type cells, nuclei (blue) are positioned off-center, toward cell–cell contacts. This polarity is lost when adhesion proteins, N- or E-cadherin, are down-regulated.
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935 The role of aneuploidy in promoting and suppressing tumors
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939 Dynamic instability of microtubules requires dynamin 2 and is impaired in a Charcot-Marie-Tooth mutant
Kenji Tanabe and Kohji Takei

949 Acetylation and activation of STAT3 mediated by nuclear translocation of CD44
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959 Mammalian Fat and Dachsous cadherins regulate apical membrane organization in the embryonic cerebral cortex
Takashi Ishiuchi, Kazuyo Misaki, Shigenobu Yor[illegible]
and Takuji Tanoue

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969 Localization of recombination proteins and Srs2 reveals anti-recombinase function in vivo
Rebecca C. Burgess [illegible]
Patrick Sung, and Rodney Rothstein

983 Loss of spindle assembly checkpoint–mediated inhibition of Cdc20 promotes tumorigenesis in mice
Min Li, Xiao Fang, Zhubo Wei, J. Philippe York, and Pumin Zhang

995 Role of Inn1 and its interactions with Hof1 and Cyk3 in promoting cleavage furrow and septum formation in *S. cerevisiae*
Ryuichi Nishihama, Jennifer H. Schreiter, Masayuki Onishi, Elizabeth A. Vallen
Julia Hanna, Katarina Moravcevic, Margaret F. Lippincott, Haesun Han,
Mark A. Lemmon, John R. Pringle, and Erfei Bi

1013 Sphingomyelin synthase-related protein SMSr controls ceramide homeostasis in the ER
Ana M. Vacaru, Fikadu G. Tafesse, Philipp [illegible]
Martin Hermansson, Jos F.H.M. Brouwers [illegible]
and Joost C.M. Holthuis

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On the cover

The mitochondrial inner membrane folds into highly involuted cristae that protrude into the mitochondrial matrix. In yeast lacking the Fcj1 protein, christae membranes (yellow) rearrange into concentrically stacked vesicular structures within the matrix.
See page 1047.

1029 Ups1p and Ups2p antagonistically regulate cardiolipin metabolism in mitochondria
Yasushi Tamura, Toshiya Endo, Miho Iijima, and Hiromi Sesaki

1047 Formation of cristae and crista junctions in mitochondria depends on antagonism between Fcj1 and Su *e/g*
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1065 HUMMR, a hypoxia- and HIF-1α–inducible protein, alters mitochondrial distribution and transport
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1083 During muscle atrophy, thick, but not thin, filament components are degraded by MuRF1-dependent ubiquitylation
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1097 Regulators of yeast endocytosis identified by systematic quantitative analysis
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1127 Prion protein attenuates excitotoxicity by inhibiting NMDA receptors
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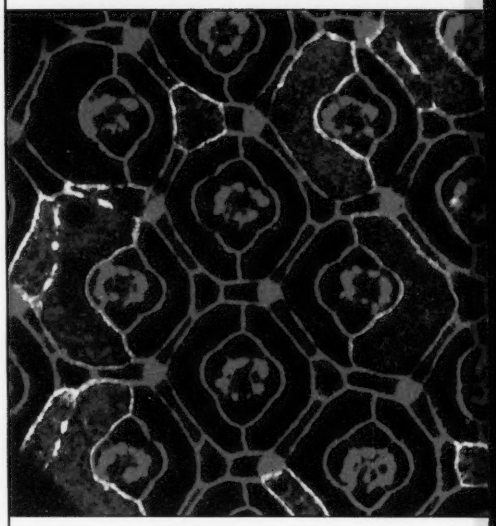

Mutant cells (green) that lack the small GTPase Rho1 demonstrate two distinct functions for the protein during developmental remodeling of the *Drosophila* pupal eye epithelium: Rho1 maintains tension in the epithelial cells and preserves the integrity of cell–cell adhesions (red).
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1159 Motor-dependent microtubule disassembly driven by tubulin tyrosination
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1181 The *Drosophila* deoxyhypusine hydroxylase homologue *nero* and its target eIF5A are required for cell growth and the regulation of autophagy
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1195 Biogenesis of cytochrome b_6 in photosynthetic membranes
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1209 Cholesterol sensor ORP1L contacts the ER protein VAP to control Rab7–RILP–p150^{Glued} and late endosome positioning
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1227 A genome-wide screen for genes affecting eisosomes reveals Nce102 function in sphingolipid signaling
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Articles with related stories in the IN THIS ISSUE section have page numbers in RED; articles related to IN FOCUS have page numbers in BLUE.

On the cover

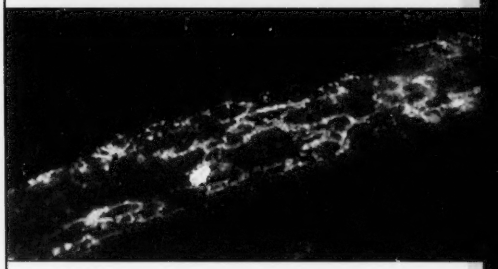
McConnell et al. reveal a new activity for microvilli in the brush border lining the small intestine. Enzymes including intestinal alkaline phosphatase (green) are sorted into vesicles and released from the tips of microvilli (red) into the gut lumen, where they may help process nutrients and fight intestinal bacteria.
See page 1235.

1243 Desmoglein 1–dependent suppression of EGFR signaling promotes epidermal differentiation and morphogenesis
Spiro Getsios, Cory L. Simpson, Shin-ichiro Kojima, Robert Harmon, Linda J. Sheu, Rachel L. Dusek, Mona Cornwell, and Kathleen J. Green

1259 MURC/Cavin-4 and cavin family members form tissue-specific caveolar complexes
Michele Bastiani, Libin Liu, Michelle M. Hill, Mark P. Jedrychowski, Susan J. Nixon, Harriet P. Lo, Daniel Abankwa, Robert Luetterforst, Manuel Fernandez-Rojo, Michael R. Breen, Steven P. Gygi, Jorgen Vinten, Piers J. Walser, Kathryn N. North, John F. Hancock, Paul F. Pilch, and Robert G. Parton

1275 Demonstration of catch bonds between an integrin and its ligand
Fang Kong, Andrés J. García, A. Paul Mould, Martin J. Humphries, and Cheng Zhu

1285 The enterocyte microvillus is a vesicle-generating organelle
Russell E. McConnell, James N. Higginbotham, David A. Shifrin Jr., David L. Tabb, Robert J. Coffey, and Matthew J. Tyska



Bastiani et al. identify a family of proteins called cavins that regulate the formation of caveolae domains at the plasma membrane of different tissues. Cavin-4 (green) localizes to the caveolae (red) of muscle myotubes.
See page 1259.